Amendments to the Claims:

1. (Previously Amended) A method of diagnostic imaging comprising:

collecting a plurality of projection data sets corresponding to each of a plurality of angles around a subject, the projection data sets being collected over less than 360°;

operating on the projection data sets with a resolution recovery algorithm; and

reconstructing the resolution recovered projection data sets into an image representation.

2. (Previously Amended) The method as set forth in claim 12 wherein the projection data sets span less an 360°.

3. (Previously Amended) A method of diagnostic imaging comprising:

collecting a plurality of projection data sets corresponding to each of a plurality of angles spanning 204° around a subject;

performing a resolution recovery process on the projection data sets; and

reconstructing the resolution recovered projection data sets into an image representation.

4. (Previously Amended) A method of diagnostic imaging comprising:

collecting a plurality of projection data sets corresponding to each of a plurality of angles around a subject spanning less than 360°;

performing a resolution recovery process in at least an angular rotation dimension, the resolution recovery process including:

zero-filling projection data sets in the angular rotation direction, such that the zero-filled and actually collected projection data sets together span 360° at regular angular increments.

5. (Original) The method as set forth in claim 4, further including:

smoothing an interface between the actually collected and zero-filled data sets.

6. (Original) The method as set forth in claim 5 further including:

transforming the smoothed data sets into frequency space;

stationarily deconvolving the frequency space data sets with a resolution recovery filter function; and

transforming the stationarily deconvolved data sets from frequency space to image space.

7. (Original) The method as set forth in claim 6 further including:

rotating detector heads continuously around the subject;

binning projection data collected over preselected angular increments into the projection data sets; and

in the deconvolving step, deconvolving the frequency space data sets with:

$$\frac{\sin(n\Delta\phi/2)}{n\Delta\phi/2}\hat{g}\left(\omega_s, \omega_z, \frac{n}{\omega_s}\right)$$

where $\Delta\phi$ is the angular increment corresponding to each data set, and $\hat{g}(\omega_s, \omega_z, n/\omega_s)$ is the resolution recovery filter function.

8. (Original) The method as set forth in claim 5 wherein the smoothing step includes:

reducing an amplitude of at least one actually collected projection data set adjacent each zero-filled data set.

9. (Original) The method as set forth in claim 8 wherein the reduction in amplitude is one-half for each value of the original actually collected projection data set adjacent each zero-filled data set.

10. (Original) The method as set forth in claim 8 wherein the actually collected data is disjoint with at least four interfaces between the actually collected and zero-filled data sets.

11. (Original) The method as set forth in claim 5 wherein the step of transforming into frequency space includes:

operating with a Fourier transform which is matched to a total of the actually collected and zero-filled data sets.

12. (Currently Amended) A method of diagnostic imaging comprising:

moving a detector head in an orbit about a subject in an examination region ~~in one of a (1) continuous rotate and (2) step and shoot mode~~;

collecting data during the orbit and organizing the data in a plurality of projection data sets corresponding to each of a plurality of angular increments around a subject;

performing an electronic resolution recovery process on the collected projection data sets; and

reconstructing the resolution recovered projection data sets into an image representation.

13. (Previously Amended) The method of claim 12 wherein the angular increments are spaced by less than 7°.

14. (Original) The method of claim 12 wherein the angular increments are spaced by 3°.

15. (Previously Amended) The method of claim 12 wherein the resolution recovery process includes correcting for blurring due to continuous rotation.

16. (Currently Amended) A method of diagnostic imaging comprising:

moving a detector head in an orbit around a subject in an examination region ~~in one of a (1) continuous rotate and (2) step and shoot mode~~;

collecting data during the orbit and organizing the data in a plurality of projection data sets corresponding to each of a plurality of angular increments around a subject;

performing a resolution recovery process on the projection data sets the resolution recovery process including:

transforming the data sets into frequency space;

performing a stationary deconvolution on the frequency space data sets with a filter, the filter used in performing the stationary deconvolution being

$$\frac{\sin(n\Delta\phi/2)}{n\Delta\phi/2}\,\hat{g}\left(\omega_s,\omega_z,\frac{n}{\omega_s}\right)$$

where $\Delta\phi$ is the angular increment over which the data is collected in each data set, and $\hat{g}(\omega_s,\omega_z,n/\omega_s)$ is a filter function for projection data collected only at the angular increments; and

transforming the stationarily deconvolved data sets from frequency space to image space; and

reconstructing the resolution recovered projection data sets into an image representation.

17. (Currently Amended) A method of diagnostic imaging comprising:

moving a detector head in an orbit spanning less than 360° about a subject in an examination region ~~in one of (1) a continuous rotate mode and (2) a step and shoot mode~~;

collecting data during the orbit and organizing the data in a plurality of projection data sets corresponding to each of a plurality of angular increments around a subject;

performing a resolution recovery process on the projection data sets, the resolution recovery process including:

zero-filling projection data sets in the angular rotation direction, the zero-filled and actually collected projection data sets together spanning 360°; and

smoothing each interface between the actually collected and zero-filled data sets, the smoothed data sets being transformed into frequency space; and

reconstructing the resolution recovered projection data sets into an image representation.

18-21. (Cancelled)

22. (Currently Amended) A diagnostic imaging apparatus comprising:

a means for collecting a plurality of projection data sets corresponding to each of a plurality of angles around a subject, the projection data sets being collected over less than 360°;

a processor for operating on the projection data sets with a resolution recovery algorithm ~~on the~~; and

a means for reconstructing the resolution recovered projection data sets into an image representation.

23. (Previously Presented) The method as set forth in claim 1 wherein the collecting step includes:

continuously moving a gantry which moves a detector head in a continuous angular orbit about a subject in an examination region; and

collecting data during the continuous orbit and sorting the data into a plurality of projection data sets corresponding to each of a plurality of angular increments around a subject.

24. (Currently Amended) An apparatus for diagnostic imaging comprising:

a means for moving a detector head in an orbit around a subject in an examination region ~~in one of a (1) continuous rotate and (2) step and shoot mode~~;

a means for collecting data during the orbit and organizing the data in a plurality of projection data sets corresponding to each of a plurality of angular increments around a subject;

an electronic processor for performing an electronic resolution recovery process on the collected projection data sets; and

a means for reconstructing the resolution recovered data projection sets into an image representation.

25. (New) The apparatus as set forth in claim 24, wherein the moving means moves the detector head continuously around the subject, each of the plurality of projection data sets corresponding to data collected during an angular increment of the continuous rotation.

26. (New) The apparatus as set forth in claim 24, wherein the moving means moves the detector head to each of a plurality of preselected positions around the orbit corresponding to each of the angular increments and stops the rotation while the data is collected, each of the projection data sets corresponding to one of the stopped positions of the detector head.

27. (New) The method as set forth in claim 12, wherein:

the moving step includes rotating the detector head continuously along the orbit; and

the collecting step includes collecting data continuously during rotation of the detector head along the orbit and sorting the collected data into data sets which correspond to angular increments of the continuous rotation.

28. (New) The method as set forth in claim 12, wherein:

the moving means moves the detector head in a step and shoot mode in which the detector head is rotated to each of a plurality of preselected locations along the orbit and stopped; and

the collecting step includes collecting data when the detector head is stopped at each of the preselected locations, each of the plurality of projection data sets corresponding to one of the preselected stopped locations.